

Preliminary Vector Sensor

- Delivers accurate 2D GPS heading data (heading and roll or pitch) with better than 0.5 degree accuracy with a short 0.5 m antenna separation
- Computes accurate heading at rates of up to 10 Hz and position at rates of up to 5 Hz
- Includes internal SBAS and beacon demodulators for differential positioning
- LED indicators located on the front panel provide a quick indication of system status
- Fast heading fix is less than 5 s after initial position
- Dual serial ports offers flexibility for data configuration
- LED indicators are present for power, GPS locks, DGPS lock, Differential Position, and Heading for quick verification of receiver status



GPS Compass

When you require accurate GPS heading information, count on the new CSI Wireless Vector Sensor to provide consistent, reliable heading results.

Using two internal GPS engines working cooperatively, the Vector Sensor uses moving base station RTK techniques to resolve real-time heading to better than 0.5 degree accuracy at rates of up to 10 Hz, regardless of differential status.

In addition to providing accurate heading information, the Vector Sensor provides sub-meter* DGPS position data when using free correction data from either a SBAS service such as WAAS and EGNOS or DGPS beacon signals, using internal demodulators. In the event that neither is available, the Sensor may use correction data from an external source if available.

Additional Sensors

In addition to using GPS to determine heading, the Vector Sensor includes other supplemental instruments. An inclinometer aids the rate at which a heading solution is computed on startup and also speeds up reacquisition. A gyro and a magnetometer are present onboard to provide a secondary source of heading data for instances when a GPS heading is not available. These sensors improve performance and increase the reliability of the Vector Sensor.

SBAS

The American Federal Aviation Administration is currently testing its Wide Area Augmentation System (WAAS) in preparation for Initial Operational Capability. The track record of WAAS has shown this system to be both accurate and reliable.

WAAS-compatible Space Based Augmentation Systems (SBAS) are also under development throughout the world, including the European Geostationary Navigation Overlay System (EGNOS) and the Japanese MTSAT Satellite-based Augmentation System (MSAS).

The Vector Sensor is compatible with each of these [free](#) correction services.

Beacon

Navigation authorities around the world have installed DGPS radiobeacon networks that broadcast free GPS correction information. The Vector Sensor uses these real-time corrections to deliver accurate, reliable positioning.

The Vector Sensor comes with a differential beacon receiver module pre-installed. An optional beacon antenna such as the CSI Wireless MBL-3 is needed if this feature is required.

COAST™ Technology

The Vector Sensor features COAST™ technology that allows it to use old correction data for up to 40 minutes without seriously affecting receiver performance. This feature offers peace of mind and allows you to focus on more important issues than reliability of a differential signal.

COAST™ operation is inherent in normal operation of the Vector Sensor. You may adjust the maximum COAST™ age by simply choosing the maximum differential correction age.

Interface

In order to provide a quick indication of current receiver status, the Vector Sensor front panel features six LED indicators for power, GPS locks (primary and secondary GPS's), differential lock (internal SBAS or beacon, or external RTCM input), and a heading indicator.

The Vector Sensor features two independent RS-232 serial ports. Either port may be configured for a variety of NMEA 0183 output or be used for input of RTCM correction data from an external source.

Sensor Setup

The separation distance between the two GPS antennas used by the Vector Sensor influences system performance. The default separation is 0.5 m which provides better than 0.5 degrees of heading accuracy.

Software

CSI Wireless freely distributes SLXMon, a Windows-based software utility used to configure and monitor the operation of the Vector Sensor.

Warranty

CSI Wireless is committed to our customers and our products, and offers a one-year warranty on parts and labor.

Contact CSI Wireless today to learn how the Vector Sensor can satisfy your GPS heading and positioning needs.



Vector Sensor

Preliminary

GPS Sensor Specifications

| | |
|---------------------------------|---|
| Receiver Type: | LI, C/A code, with carrier phase smoothing |
| Channels: | 12-channel, parallel tracking (10-channel when tracking SBAS) |
| Update Rate: | 5 Hz max |
| Horizontal Accuracy: | <1 m 95% (DGPS) <5 m 95% (autonomous, no Selective Availability) |
| Heading Accuracy: | <0.5 degrees rms (0.5 m baseline) |
| Cold Start TTFF: | 60 s typ. (no almanac or RTC ^{***}) |
| Warm Start 1 TTFF: | 45 s typ. (valid almanac, no RTC) |
| Warm Start 2 TTFF: | 35 s typ. (valid almanac and RTC) |
| Hot Start TTFF: | 15 s typ. (valid almanac, RTC, and < 2 hours since last fix) |
| Heading Fix: | < 5 s typical after first position fix with inclinometer aiding |
| GPS Reacquisition: | < 1 s |
| Antenna Input Impedance: | 50 Ω |

Beacon Sensor Specifications

| | |
|------------------------------------|------------------------------|
| Channels: | 2-channel, parallel tracking |
| Frequency Range: | 283.5 to 325 kHz |
| Operating Modes: | Automatic and manual |
| Sensitivity: | 1.5 for 6 dB SNR @ 200 bps |
| Dynamic Range: | 100 dB |
| Adjacent Channel Rejection: | 65 dB |

Communications

| | |
|---------------------------------|--|
| Serial ports: | 2 full duplex RS-232 |
| Baud Rates: | 4800, 9600, 19200 |
| Correction I/O Protocol: | RTCM SC-104 |
| Data I/O Protocol: | NMEA 0183, SLX binary |
| Timing Output: | 1 PPS (HCMOS, active high, rising edge sync, 10 k Ω , 10 pF load) |
| NMEA Messages: | GGA, GLL, GSA, GST, GSV, VTG, ZDA, RMC, RRE, HDT, ROT |

Environmental

| | |
|-------------------------------|--------------------|
| Operating Temperature: | -30°C to +70°C |
| Storage Temperature: | -40°C to +85°C |
| Humidity: | 95% non-condensing |

CSI Wireless Dealer



Avery label #05260 (laser print)

Power

| | |
|--|-------------------|
| Input Voltage: | 9.5 to 48 VDC |
| Load Dump Protection: | Up to 86 VDC |
| Reverse Polarity Protection: | Yes |
| Power Consumption: | < 8 W |
| Current Consumption: | < 650 mA @ 12 VDC |
| Antenna Voltage Output: | 5 VDC |
| Antenna Short Circuit Protection: | Yes |

Mechanical

| | |
|------------------------------|---|
| Dimensions: | 203 mm L x 139 mm W x 64 mm H (8.00" L x 5.47" W x 2.52" H) |
| Weight: | <1000 g (<2.2 lb) |
| Status Indication: | Power, GPS lock, differential lock, DGPS position, and heading indication |
| Power Switch: | Miniature push-button |
| Power/Data Connector: | 2-pin circular miniature |
| Antenna Connectors: | TNC female |
| Antenna Separation: | Default 0.5 m between phase centers |

Pin-out

Primary GPS Port A

| | |
|-------|---------------------|
| Pin 2 | Transmit Data (TXD) |
| Pin 3 | Receive Data (RXD) |
| Pin 5 | Signal Ground |

Primary GPS Port B

| | |
|-------|---------------------|
| Pin 2 | Transmit Data (TXD) |
| Pin 3 | Receive Data (RXD) |
| Pin 5 | Signal Ground |
| Pin 6 | Event Marker Input |
| Pin 9 | 1 Pulse Per Second |

* Depends on multipath environment, number of satellites in view, satellite geometry, baseline length (for local services), and ionospheric activity

** Depends on multipath environment, number of satellites in view, and satellite geometry)

*** Real-time clock

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